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CLAIMS

- 1. A tumor cell which is modified to express a T cell costimulatory molecule, B7-2.
- 2. The tumor cell of claim 1 which is transfected with a nucleic acid encoding B7-2 in a form suitable for expression of B7-2.
- 3. The tumor cell of claim 1 which is stimulated to express B7-2.
- 4. The tumor cell of claim 1 which has B7-2 coupled to the tumor cell.
 - 5. The tumor cell of claim 1 which expresses a T cell costimulatory molecule, B7.
- 15 6. The tumor cell of claim 1-which expresses a T cell costimulatory molecule, B7-3.
 - 7. The tumor cell of claim which expresses an MHC class I molecule.
- 20 8. The tumor cell of claim 1 which expresses an MHC class II molecule.
 - 9. The tumor cell of claim 1 which normally expresses an MHC class II associated protein, the invariant chain, and wherein expression of the invariant chain is inhibited.
 - 10. A tumor cell which is modified to express a T call costimulatory molecule, B7-3.
- The tumor cell of claim 10 which is transfected with a nucleic acid encoding B7-3 in a form suitable for expression of B7-3.
 - 12. The tumor cell of claim 10 which is stimulated to express B7-3.
 - 13. The tumor cell of claim 10 which has B7-3 coupled to the tumor cell.
 - 14. The tumor cell of claim 10 which expresses a T cell costimulatory molecule, B7.
 - 15. The tumor cell of claim 10 which expresses a T cell costimulatory molecule, B7-2.

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- 16. The tumor cell of claim 10 which expresses an MHC class I molecule.
- 17. The tumor cell of claim 10 which expresses an MHC class II molecule.
- 5 \ 18. The tumor cell of claim 10 which normally expresses an MHC class II associated protein, the invariant chain, and wherein expression of the invariant chain is inhibited.
- 19. A tumor cell transfected with a nucleic acid encoding a T cell costimulatory molecule, B7-2, in a form suitable for expression of B7-2.
 - 20. The tumor cell of claim 19 wherein the nucleic acid is a cDNA in a recombinant expression vector.
- The tumor cell of claim 19 further transfected with a nucleic acid encoding a T cell costimulatory molecule, B7, in a form suitable for expression of B7.
 - 22. The tumor cell of claim 19 further transfected with a nucleic acid encoding a T cell costimulatory molecule, B7-3, in a form suitable for expression of B7-3.
 - 23. The tumor cell of claim 19 further transfected with at least one nucleic acid comprising DNA encoding:
 - (a) at least one MHC class INa chain protein; and
 - (b) at least one MHC class II β chain protein,
 - wherein the nucleic acid is in a form suitable for expression of the MHC class II α chain protein(s) and the MHC class II β chain protein(s).
 - 24. The tumor cell of claim 23 which does not express MHC class II molecules prior to transfection of the tumor cell.
- The tumor cell of claim 19 further transfected with at least one nucleic acid encoding at least one MHC class I α chain protein in a form suitable for expression of the MHC class I protein(s).



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- 26. The tumor cell of claim 25 further transfected with a nucleic acid encoding a β-2 microglobulin protein in a form suitable for expression of the β-2 microglobulin protein.
- The tumor cell of claim 19 which normally expresses an MHC class II associated protein, the invariant chain, and wherein expression of the invariant chain is inhibited.
- The tumor cell of claim 27 wherein expression of the invariant chain is inhibited by transfection of the tumor cell with a nucleic acid which is antisense to a regulatory or a coding region of the invariant chain gene.
 - 29. The tumor cell of claim 19 which is a sarcoma.
- 15 30. The tumor cell of claim 19 which is a lymphoma.
 - 31. The tumor cell of claim 19 which is selected from a group consisting of a melanoma, a neuroblastoma, a leukemia and a carcinoma.
- 20 32. A sarcoma cell which is modified to express a T cell costimulatory molecule, B7-2.
 - 33. The sarcoma cell of claim 32 which is transfected with a nucleic acid encoding B7-2 in a form suitable for expression of B7-2.
 - 34. The sarcoma cell of claim 32 which expresses a Tcell costimulatory molecule, B7.
- 35. The sarcoma cell of claim 32 which expresses a T cell costimulatory molecule, 30 B7-3.
 - 36. The sarcoma cell of claim 32 which expresses an MHC class I molecule.
 - 37. The sarcoma cell of claim 32 which expresses an MHC class II molecule.
 - 38. A composition suitable for pharmaceutical administration comprising an amount of the tumor cells of claim 1 and a physiologically acceptable carrier.

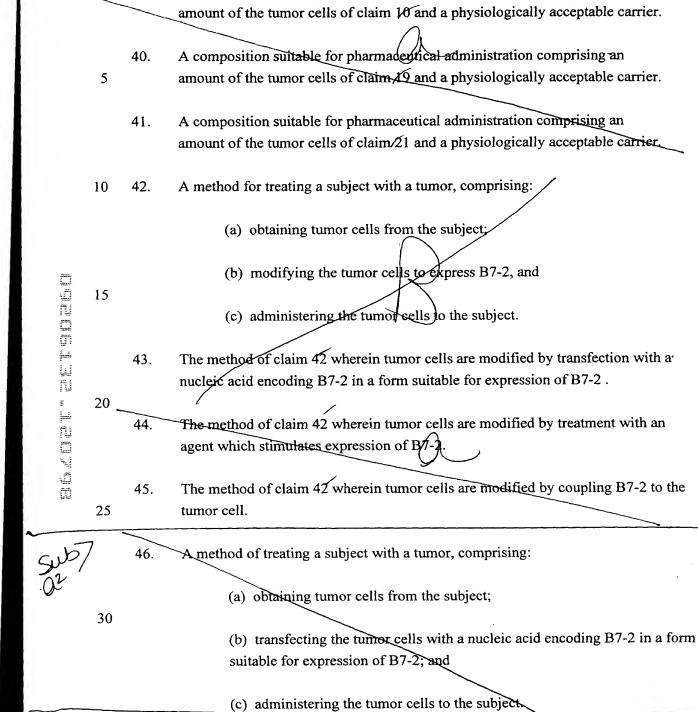
A composition suitable for pharmaceutical administration comprising an

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nucleic acid encoding 17.



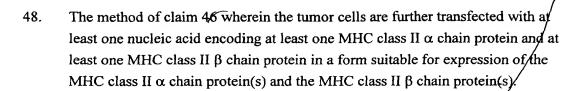
The method of claim 40 wherein the tumor cells are further transfected with a

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- 49. The method of claim 46 wherein the tumor cells are further transfected with at least one nucleic acid encoding at least one MHC class I α chain protein in a form suitable for expression of the MHC class I protein(s).
- 10 50. The method of claim 49 wherein the tumor cells are further transfected with a nucleic acid encoding a β-2 microglobulin protein in a form suitable for expression of the β-2 microglobulin protein.
 - 51. The method of claim 46 wherein expression of an MHC class II associated protein, the invariant chain, is inhibited in the tumor cells.
 - 52. The method of claim 51 wherein expression of the invariant chain is inhibited in the tumor cells by transfection of the tumor cell with a nucleic acid which is antisense to a regulatory or a coding region of the invariant chain gene.
 - 53. The method of claim 46 wherein the tumor is a sarcoma.
 - 54. The method of claim 6 wherein the tumor is a lymphoma.
- The method of claim 46 wherein the tumor is selected from a group consisting of a melanoma, a neuroblastoma, a leukemia and a carcinoma.
 - 56. The method of claim 46 wherein the tumor cells are administered by intravenous injection.
 - 57. The method of claim 46 wherein the tumor cells are administered by a route selected from a group consisting of intramuscular injection, intraperitoneal injection and subcutaneous injection.

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-53-58. A method for preventing or treating metastatic spread of a tumor or preventing of treating recurrence of a tumor in a subject, comprising: (a) obtaining tumor cells from the subject; (b) transfecting the tumor cells with a nucleic acid encoding B7-2 in a form suitable for expression of B7-2; and (c) administering the tumor cells to the subject. The method of claim 58 wherein the tumor cells are further transfected with a 59. nucleic acid encoding B7. 60. A method of inducing an anti-tumor response by CD4+ T lymphocytes in a subject with a tumor, comprising: (a) obtaining tumor cells from the subject; (b) transfecting the tumor cells with at least one nucleic acid comprising DNA encoding: (i) B7-2 (ii) and MHC class II α chain protein, and (ili) an MHC class II β chain protein, wherein the nucleic acid is in a form suitable for expression of B7-2, the MHC class II α chain protein and the MHC class II β chain protein; and (c) administering the tumor cells to the subject.

Sub B A method for treating a subject with a tumor comprising modifying tumor cells in vivo to express a T cell costimulatory molecule, B7-2.

> The method of claim of wherein tumor cells are modified in vivo by delivering 62. to the subject in vivo a nucleic acid encoding B7-2 in a form suitable for expression of B7-2.

- The method of claim 61 wherein the nucleic acid is delivered to the subject in 63. vivo by injection of the nucleic acid in an appropriate vehicle into the tumor.
- A method for treating a subject with a tumor, comprising: 64.

- (a) obtaining tumor cells and T lymphocytes from the subject;
- (b) culturing the T lymphocytes from the subject in vitro with the tumor cells from the subject and with a stimulatory form of B7-2; and

(c) administering the T lymphocytes to the subject.

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add B'> ADD